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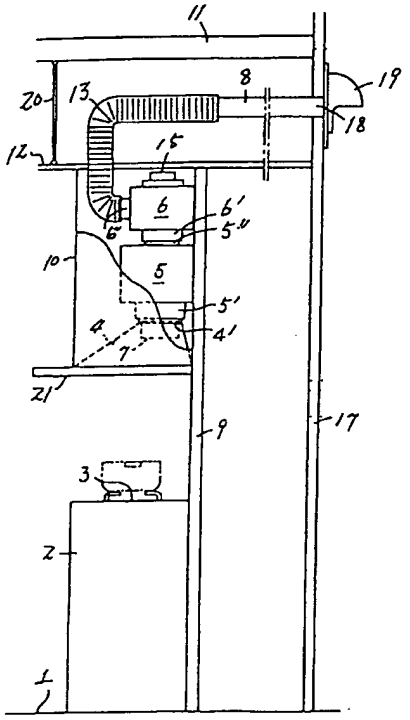
(54) Exhaust apparatus for cooking and mounting method thereof

(57) The cooking exhaust apparatus according to the present invention comprises: a smoke collecting hood (4) arranged just above a range (3) of a cooking equipment (2); an exhaust blower (6) connected to the upper portion of the smoke collecting hood (4) for exhausting smoke generated by the range (3) and collected by the smoke collecting hood (4); and an air chamber (5) interposed between the smoke collecting hood (4) and the exhaust blower (6) having a tubular body with a lower end inlet (5') connected to an upper exhaust port (4') of the smoke collecting hood (4) and an upper end outlet (5") connected to a lower drawing port (6') of the exhaust blower (6). The inner diameter of the tubular body of the air chamber (5) is greater than those of the lower end inlet (6') and the upper end outlet (6").

Fig. 1



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Description

BACKGROUND OF THE INVENTION

Field of the Invention:

This invention relates to an exhaust apparatus for cooking and a method for mounting the exhaust apparatus.

Description of the Related Art:

In a conventional cooking exhaust apparatus used in a multistoried dwelling house, a smoke collecting hood which opens out downwardly is arranged just above a gas range of a cooking equipment, and an exhaust blower is mounted within the smoke collecting hood. Therefore, it has been difficult to draw smoke uniformly from the whole area of the downward opening of the hood into the exhaust blower.

In order to dissolve this problem, it needs to enlarge the capacity of the exhaust blower or to provide a means for making a convection of smoke under a smoke inlet of the exhaust blower in the smoke collecting hood.

However, this results in the reduction of the drawing power of the exhaust blower and smoke cannot be sufficiently exhausted.

SUMMARY OF THE INVENTION

It is an object of this invention to provide a cooking exhaust apparatus which can collect smoke with high efficiency and high safety for use in a kitchen of a multistoried dwelling house or a detached house.

It is another object of this invention to provide a method for easily and quickly mounting the above-described cooking exhaust apparatus in place of an existing conventional exhaust apparatus.

To achieve the above object, a cooking exhaust apparatus according to the present invention comprises a smoke collecting hood arranged just above a range of a cooking equipment; an exhaust blower connected to the upper portion of said smoke collecting hood for exhausting smoke generated by the range and collected by said smoke collecting hood; and an air chamber interposed between said smoke collecting hood and said exhaust blower having a tubular body with a lower end inlet connected to an upper exhaust port of said smoke collecting hood and an upper end outlet connected to a lower drawing port of said exhaust blower, the inner diameter of the tubular body being greater than those of the lower end inlet and the upper end outlet.

The cooking equipment may be mounted on a floor.

The smoke collecting hood may include guide plates for rectifying ascending smoke provided therein.

The tubular body of the air chamber may be cylindrical or square. The cooking exhaust apparatus may further comprise a connecting pipe for connecting between the upper exhaust port of the smoke collecting hood and the lower end inlet of the air chamber, the upper portion of said connecting pipe protruding in said air chamber to form an oil sink between the inner wall of the tubular body and the outer wall of the protruded connecting pipe.

The upper end of the connecting pipe may be covered by a fire extinguishing net.

When the above-described cooking exhaust apparatus is mounted in place of an existing conventional exhaust apparatus, an exhausting port of the exhaust blower may be connected to an existing exhaust pipe provided in a ceiling.

In case of switching on a range of a cooking equipment mounted on a floor and cooking by using a pan or a gridiron through a trivet, steam, particles of oil, smoke from grilled food and so on (hereinafter, generically referred as "smoke") are generated.

By driving an exhaust blower before cooking, air within an air chamber is drawn from a downward drawing port of the exhaust blower so that the inside of the air chamber is depressurized and the air may be exhausted to the outdoor through an exhaust pipe provided in the ceiling.

Since the inner diameter of the tubular body of the air chamber is greater than those of the lower end inlet and the upper end outlet of the air chamber, air existing along the inner wall of the tubular body is led upwards by the air flow from the lower end inlet to the upper end outlet to depressurize the portion. Further, the suction of the blower maintains the depressurised state of the portion along the inner wall of the tubular body to rise the suction power in the lower end inlet.

By providing guide plates for rectifying ascending smoke in the smoke collecting hood, the ascending flow of smoke is promoted. Further, since smoke or flame generated by cooking comes into contact with the guide plates, the plates absorb heat from smoke or flame to prohibit heat from accumulating and the flame will be extinguished. Heat is also absorbed by the fire extinguishing net when the air flow passes therethrough. As a result, remaining flame is extinguished and ascending particles of oil to be scattered will fall into the oil sink formed between the inner wall of the tubular body and the outer wall of the protruded connecting pipe. That is, dripping or ascending of the oil particles is obstructed.

The cooking exhaust apparatus according to the present invention can be mounted in each of kitchens of a multistoried dwelling house in place of an existing conventional exhaust apparatus by connecting an exhausting port of the exhaust blower to an existing exhaust pipe provided among the beams.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a side view showing a cooking exhaust apparatus according to an embodiment of the present invention,

Fig. 2 is a side view showing a cooking exhaust apparatus according to another embodiment,

Figs. 3 and 4 are a side view and a front view showing a cooking exhaust apparatus according to still another embodiment, respectively,

Fig. 5 is a sectional view taken along line A-A in Fig. 4,

Fig. 6 is a sectional view showing a cooking exhaust apparatus according to another embodiment,

Figs. 7 and 8 are a perspective view and a exploded perspective view showing a cooking exhaust apparatus according to another embodiment, respectively, and

Fig. 9 is a sectional view of the apparatus shown in Fig. 7.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Preferred embodiments of the present invention will be hereinafter described in detail with reference to the accompanying drawings in which the same reference numerals denote the same or corresponding components.

In Figs. 1 to 6, a cooking equipment 2 is located on a floor 1 of a kitchen in a multistoried dwelling house or a detached house in a state of touching a wall 9. A gas or electric range 3 is mounted on the upper surface of the cooking equipment 2, and a smoke collecting hood 4 is arranged just above the range 3. Provided at the left and right sides of the hood 4 is a hanging cupboard. Therefore, a vertical cover board 10 is provided in front of the hood 4 on the same vertical plane as a front surface of the hanging cupboard.

The smoke collecting hood 4 has a shape of a truncated pyramid tube and is provided with a plurality of guide plates for rectifying ascending smoke 7 which are arranged symmetrically with respect to right and left in a direction of an upper exhaust port 4' of the hood 4. The central one of the plates 7 is the highest, and the farther separated to right and left, the lower the plates 7 are. The plates 7 are made of stainless steel and have a function of absorbing heat.

As shown in Figs. 1 and 3 to 9, disposed above the smoke collecting hood 4 is an air chamber 5 having a tubular body with a lower end inlet 5' and an upper end outlet 5". The lower end inlet 5' is connected and fitted to the upper exhaust port 4' of the hood 4, while the upper end outlet 5" is connected and fitted to a lower drawing port 6' of an exhaust blower 6. The tubular body of the air chamber 5 may be cylindrical or square and the inner diameter thereof is greater than those of the lower end inlet 5' and the upper end outlet 5".

As shown in Fig. 2, the lower drawing port 6' of the exhaust blower 6 may be connected to the upper end outlet 5" of the air chamber 5 through a connecting pipe 10a. A flexible pipe or bellows pipe may be used as the connecting pipe 10a. By using the connecting pipe 10a, the exhaust blower 6 may be disposed between a slab 11 and a suspended ceiling 12 and be straightly connected to an exhaust pipe 8 provided in the ceiling.

A sirocco fan and the like may be used as the exhaust blower 6. An exhausting port 6" of the exhaust blower 6 may be straightly connected to a new or existing exhaust pipe 8 provided in the ceiling (Fig. 2), or connected to the exhaust pipe 8 with bending by using a bellows pipe 13 (Figs. 1 and 3 to 5). In a kitchen of a detached house, as shown in Fig. 6, the exhausting port 6" of the exhaust blower 6 rather opens to a newly-established ventilation window 14.

As shown in Figs. 7 and 8, the upper exhaust port 4' of the hood 4 and the lower end outlet 5' of the air chamber 5 may be formed so as to have square shapes, and a cylindrical connecting pipe 5a may be connected to the lower end outlet 5' such that the upper portion 5a' of the connecting pipe 5a protrudes in the tubular body to form an oil sink a having a doughnut shape between the inner wall of the tubular body and the outer wall of the protruded upper portion 5a' of the connecting pipe 5a, as shown in Fig. 9.

The upper end of the protruded upper portion 5a' of the connecting pipe 5a may be covered by a fire extinguishing metal net 22 having a dome shape, as shown in Fig. 9.

In the drawings, numeral 15 denotes a motor of the exhaust blower 6, 16 a rotating fan, 17 an outer wall, 18 an outer wall opening of the exhaust pipe 8, 19 a cover for the opening 18, 20 a hanging jig, and 21 a smoke introducing plate.

In the cooking exhaust apparatus according to the present invention, an air chamber is interposed between a smoke collecting hood just above a cooking equipment and an exhaust blower, and the inner diameter of a tubular body of the air chamber is greater than those of a lower end inlet and an upper end outlet of the air chamber. Therefore, the inside of the air chamber is depressurized and the suction power can be increased.

Since guide plates for rectifying ascending smoke are provided within the smoke collecting hood, the ascending flow of smoke is promoted and smoke generated by cooking is apt to be collected to the central portion from the lower end of the hood so that the exhaust of smoke can be well practiced. Further, the plates absorb heat from smoke or flame to extinguish the flame.

Ascending particles of oil are caught into an oil sink to maintain the blower and the exhaust pipe to be clear. A fire extinguishing net also absorbs heat from smoke or flame so that extinguishment of flame is surely done.

Claims

1. A cooking exhaust apparatus comprising:

   a smoke collecting hood (4) arranged just above a range (3) of a cooking equipment (2);
   an exhaust blower (6) connected to the upper

portion of the smoke collecting hood (4) for exhausting smoke generated by the range (3) and collected by the smoke collecting hood (4); and

an air chamber (5) interposed between the smoke collecting hood (4) and the exhaust blower (6) having a tubular body with a lower end inlet (5') connected to an upper exhaust port (4') of the smoke collecting hood (4) and an upper end outlet (5") connected to a lower drawing port (6') of the exhaust blower (6), the inner diameter of the tubular body being greater than those of the lower end inlet (5') and the upper end outlet (5").

2. The apparatus according to claim 1, wherein the cooking equipment (2) is mounted on a floor (1).

3. The apparatus according to claim 1 or 2, wherein the smoke collecting hood (4) includes guide plates (7) for rectifying ascending smoke provided therein.

4. The apparatus according to any of claims 1 to 3, wherein the tubular body of the air chamber (4) is cylindrical or square.

5. The apparatus according to any of claims 1 to 4, further comprising a connecting pipe (5a) for connecting between the upper exhaust port (4') of the smoke collecting hood (4) and the lower end inlet (5') of the air chamber (5), the upper portion (5a') of the connecting pipe (5a) protruding in the air chamber (5) to form an oil sink (a) between the inner wall of the tubular body and the outer wall of the protruded connecting pipe (5a).

6. The apparatus according to claim 5, further comprising a fire extinguishing net (22) covering the upper end of the connecting pipe (5a).

7. A method for mounting a cooking exhaust apparatus according to one of claims 1 to 6 comprising the following steps:

connecting an exhausting port (6") of an exhaust blower (6) to an existing exhaust pipe (8) provided in a ceiling (12).

Fig. 1

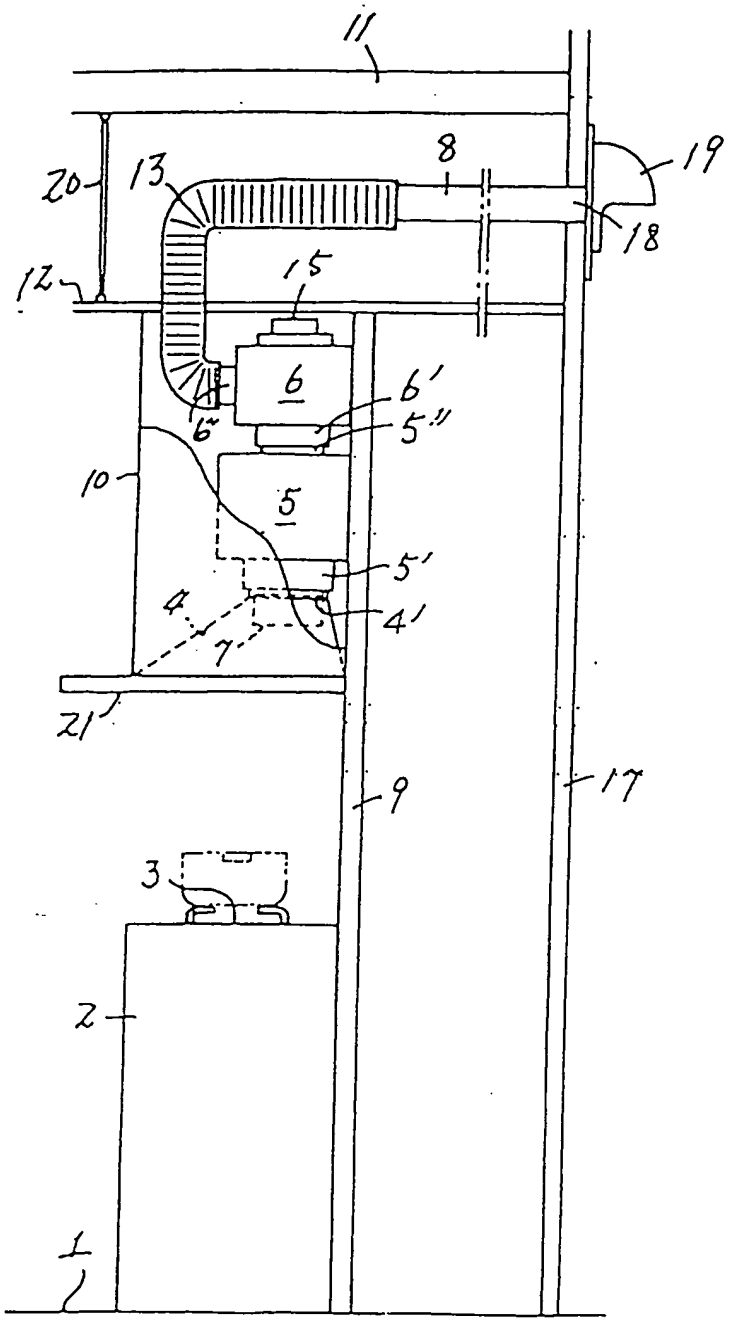

Fig. 2

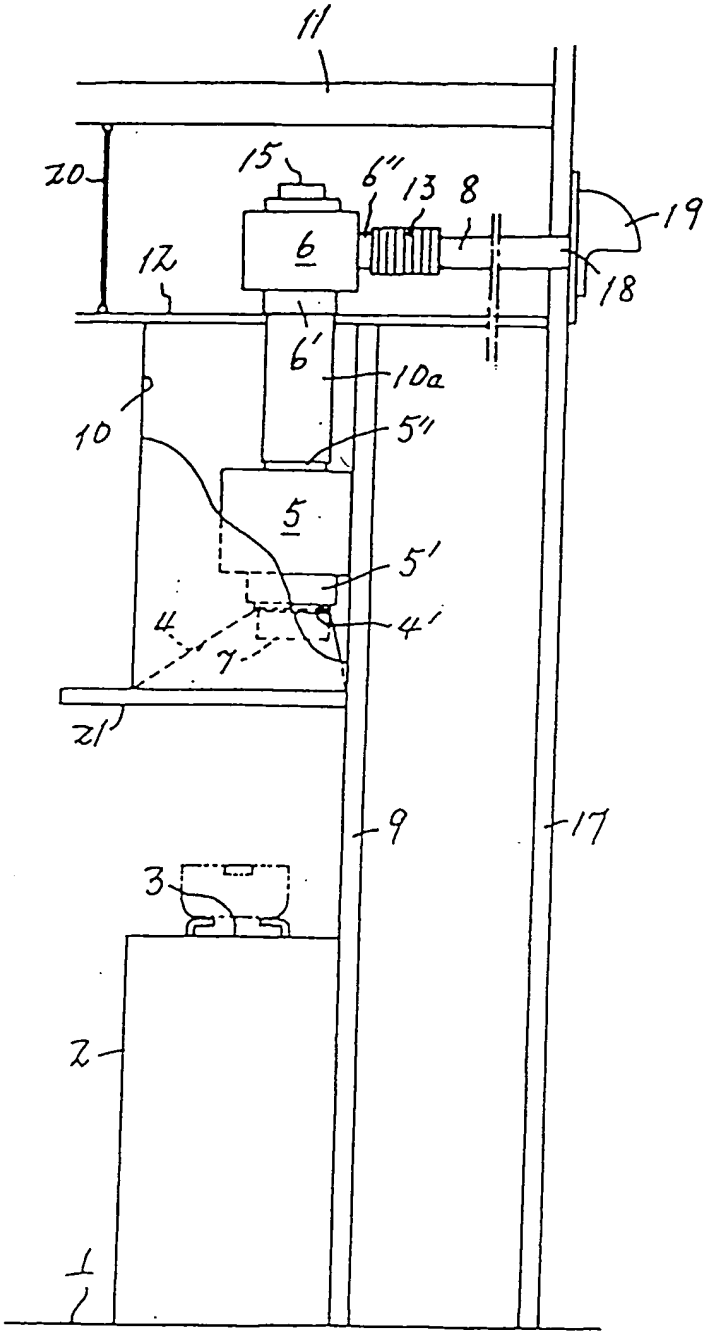

Fig. 3

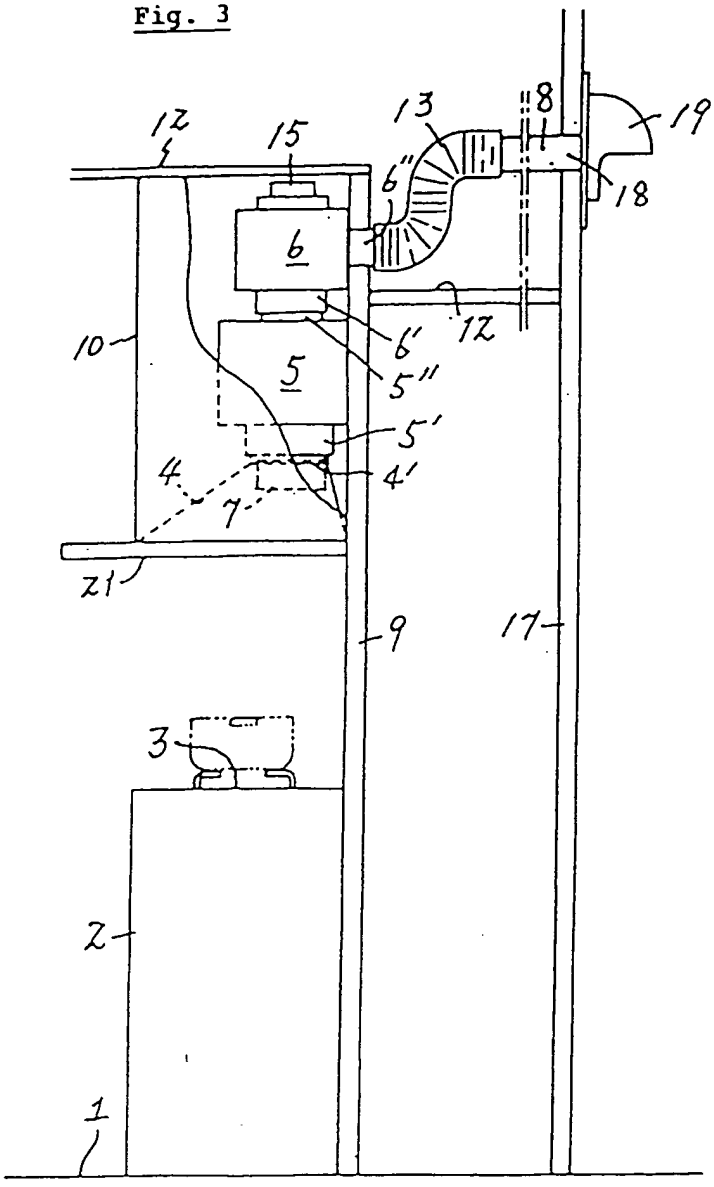

Fig. 4

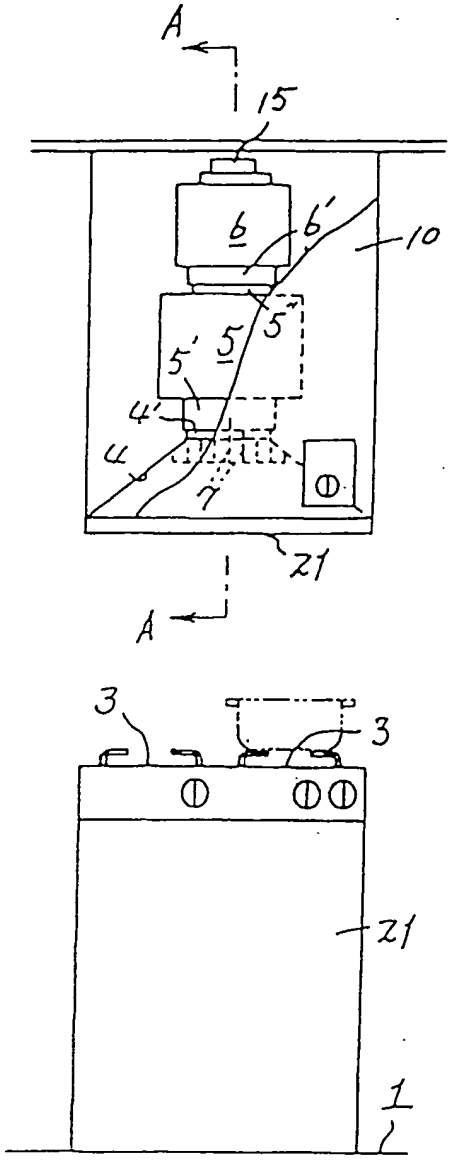

Fig. 5

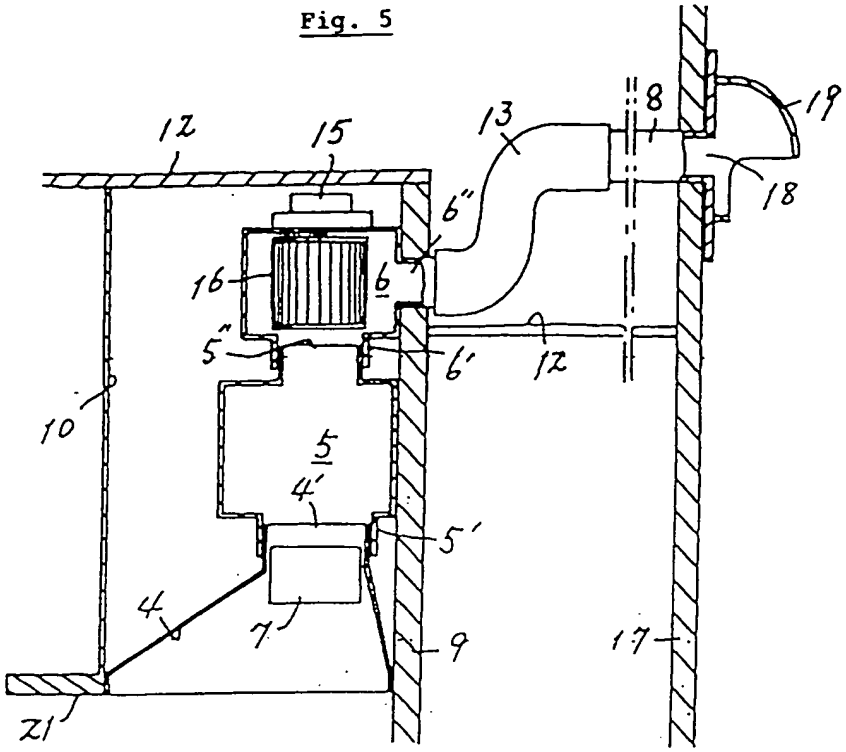
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Fig. 6

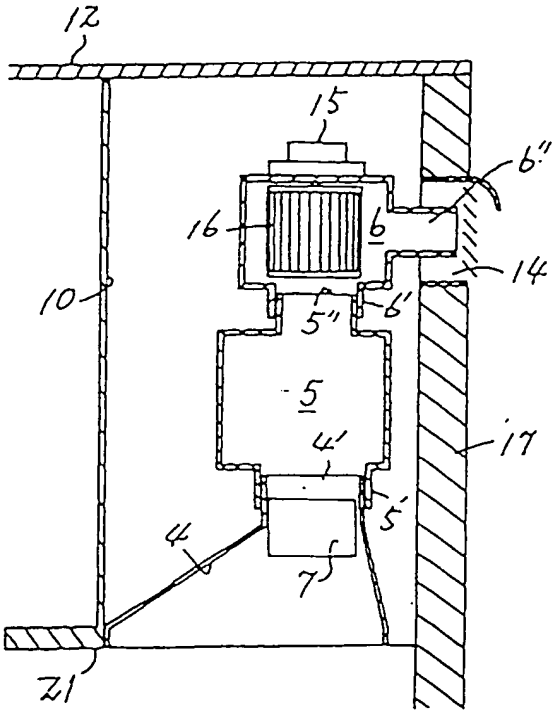
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Fig. 7

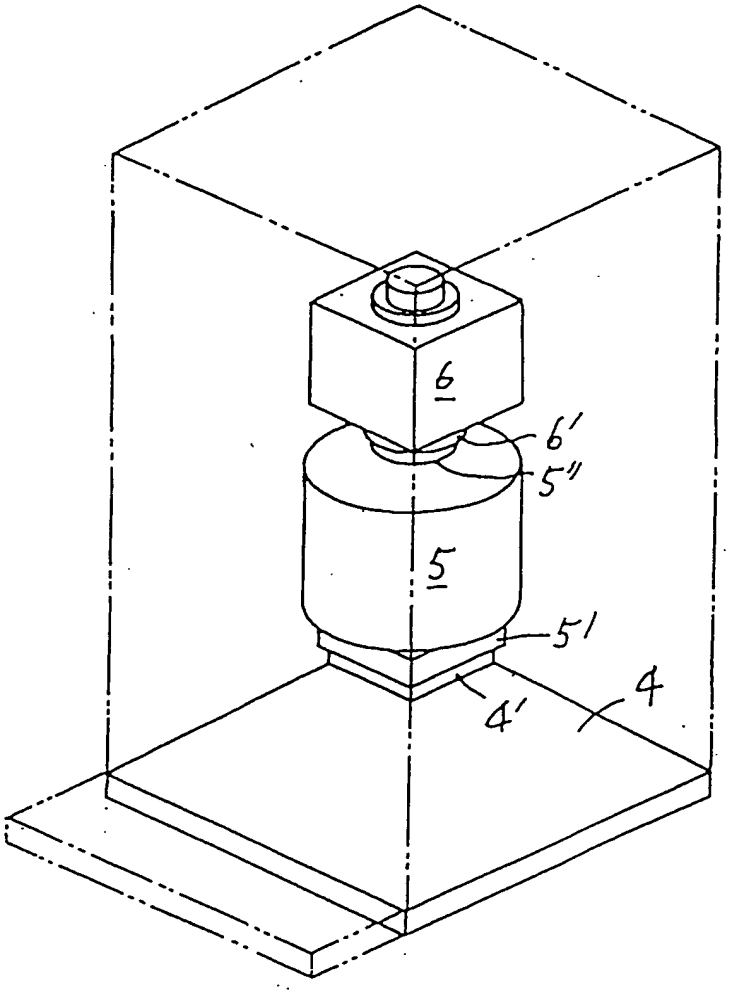


Fig. 8

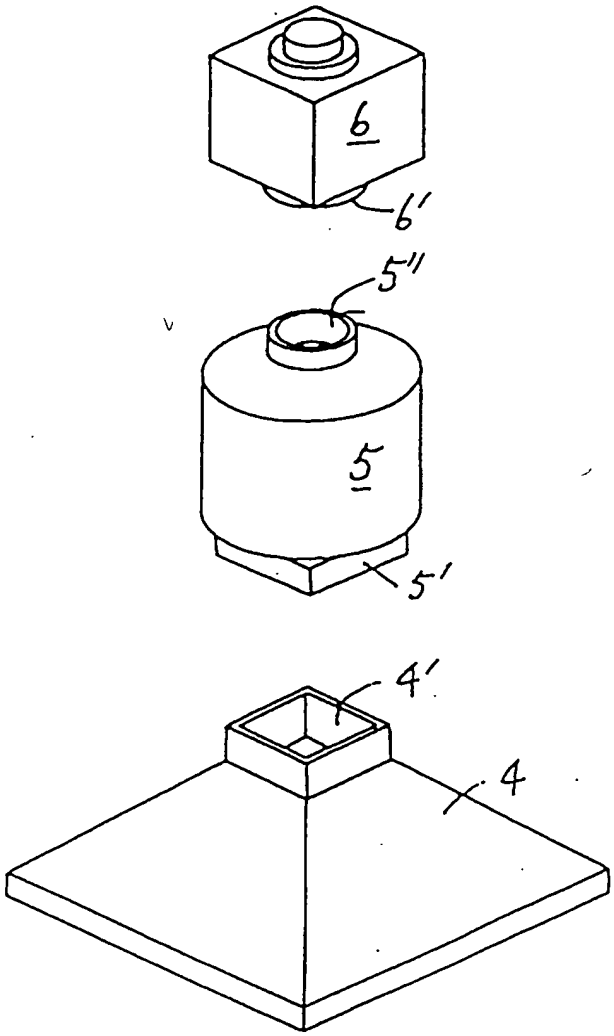
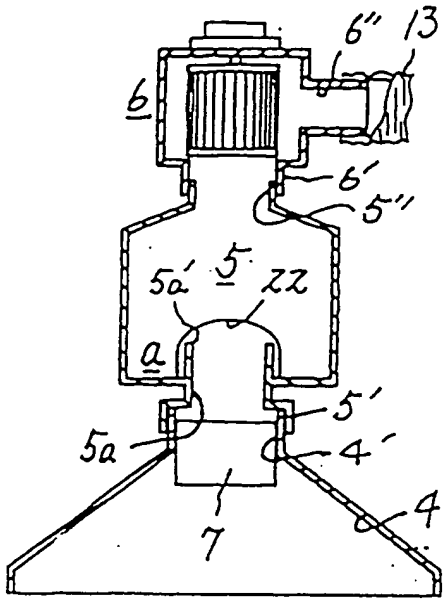


Fig. 9



European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 96 11 3860

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	US-A-4 235 220 (HEPNER ROBERT J) 25 November 1980 * column 4, line 66 - column 5, line 58; figures 3,4 *	1,2,4,7	F24C15/20
X	US-A-4 098 174 (LANDY JEROME J) 4 July 1978 * column 4, line 54 - column 4, line 64; figure 2 *	1,2,4	
A	US-A-3 889 581 (BRAY SR WILLIAM W) 17 June 1975 * figure 1 *	1,2,4,7	
A	FR-A-2 584 630 (FRITSCH SA) 16 January 1987 * page 3, line 7 - page 4, line 5; figure 1 *	3,5	
A	US-A-4 084 947 (EAR FRANK P) 18 April 1978 * figure 2 *	6	

TECHNICAL FIELDS SEARCHED (Int.Cl.6)

F24C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
MUNICH	10 December 1996	Filtri, G

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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